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EXAMINER

MISLEH, JUSTIN P

ART UNIT	PAPER NUMBER
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2612

DATE MAILED: 07/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/408,873

Applicant(s)

SEEGER ET AL.

Examiner

Justin P Misleh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25 - 28 is/are allowed.
- 6) ☒ Claim(s) 1 - 24, 29, and 30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 April 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: unclear labeling. On page 13 (line 3) of the disclosure, the Examiner suggests changing *General Purpose Computer 210* to *General Purpose Computer 210 (Figure 2)*, since 210 is not shown in figure 1.

Appropriate correction is required.

2. The disclosure is objected to because of the following informalities: an inconsistency. On page 18 (line 5) of the disclosure, the Examiner suggests changing *the lower left hand region* to *the lower right hand region*, since *View 2 320* is shown in figure 3 in the lower right hand region of 300. Page 20 (line 13) of the disclosure presents a similar error in reference to figure 4A.

Appropriate correction is required.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 202 (page 16, line 2). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "137" has been used to designate both *Pointing Device* and *Camera System*.

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The Examiner notes that the same error is made within the disclosure. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to because of an inconsistency within the disclosure. On page 16 (line 13), the processor is labeled as *Processor 205*, which is inconsistent with figure 2. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 700 (figures 7A and 7B) and 990 (figure 9). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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8. Claims 1, 2, 4, and 6 – 9, 15 – 17, and 21 – 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Chevrette et al. For the following rejections please refer to figures 1d, 2, 3a, 3b, 4a, 4b, and 5 and columns 6 (lines 34 – 67), 7, and 8 (lines 1 – 39). The Examiner notes that figures 1d and 2 encompass the scope of the invention while figures 3a, 3b, 4a, 4b, and 5 show varying embodiments of the invention.

9. For claim 1, Chevrette et al. disclose, a camera system, comprising: a lens (10) positionable to a plurality of predetermined offset positions within a lens plane (L – with the solid black lines and the dotted black lines representative of light rays when the lens is positioned in a plurality of predetermined offset positions I and I'), the lens plane located substantially orthogonal to an optical axis of the lens (clearly shown in figure 2); and an image sensor (detector array) having a relatively planar surface (12) and operable to detect light rays originating from one or more objects within an area having a plurality of views, wherein each view is recorded while the lens is positioned at a corresponding one of the predetermined offset positions (see figure 1d).

Chevrette et al. teach of a camera system that displaces the lens (10) by a distance (d), thereby displaying the optical axis of the lens, as well as the focal point, and the image on the image plane by the same distance while capturing an image at each offset position. Chevrette et al. also teach that the lens (10) is replaced, in the preferred embodiment, by a lens block comprising several lens elements coupled together.

10. As for claim 2, Chevrette et al. teach, the camera system of claim 1, wherein the image sensor represents a CCD array sensor (detector array).

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11. As for claim 4, although Chevrette et al. do not explicitly teach, the camera system of claim 1, further comprising a light shield and a housing partially enclosing the image sensor, the light shield attached between the lens and the housing, it is inherent that a light shield exists and that a housing partially encloses the image sensor. If a housing, which partially encloses the image sensor, and light shield which is attached between the lens and the housing, did not exist, the camera system of Chevrette et al. would be an inoperable system, by continuously saturating the image sensor and producing images not representative of the scene in which the user is attempting to capture.

12. As for claim 6, Chevrette et al. applies the concepts of figure 2 to the preferred embodiment (figure 3a) of the invention and disclose the camera system of claim 1, further including a translation mechanism (24 and 26) coupled to the lens (11 in the embodiment) and operable to position the lens at the plurality of predetermined offset positions.

13. As for claim 7, Chevrette et al. disclose, the camera system of claim 6, wherein the translation mechanism (24 and 26) includes one or more computer-controlled linear actuators (x-axis 24 and y-axis 26) coupled to a translational stage (22). Chevrette et al. teach the camera system is well suited to being used in a microprocessor driven system (see column 8, lines 32 – 36), therefore, it is inherent that all devices within the system are computer-controlled.

14. As for claim 8, Chevrette et al. disclose, the camera system of claim 1, wherein the lens plane (L) is positioned substantially parallel to the relatively planar surface (12) of the image sensor (detector array).

15. For claim 9, Chevrette et al. disclose, an image acquisition system, comprising: a camera system operable to record a plurality of camera images by shifting a camera lens (10) in plane

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substantially orthogonal (clearly shown in figure 2) to an optical axis (I) of the camera lens, wherein each camera image represents one of a plurality of views of an area, the area includes one or more objects (the helicopter); and an image processing system coupled to the camera system and operable to combine the plurality of camera images to produce a composite image of the area.

Chevrette et al. teach an imaging system comprising an array of sensing elements defining an image plane; a lens system adapted to focus an image on the image plane; and linear actuators coupled to the lens system for moving the lens system a predetermined amount and on a predetermined plane parallel to the image plane so that the image focused by the lens system on the array of sensing elements is displaced on the image plane by the movement of the lens system. Four images are recorded from four different displacements/views of the lens, thereby encompassing the entire field. The final image is then obtained from the four images previously acquired by interlacing all the pixels from the four views to form a high-resolution image.

Chevrette et al. teach the imaging system is well suited to being used in a microprocessor driven system (see column 8, lines 32 – 36), therefore, it is inherent that all devices/processes within the system are computer-controlled. Chevrette et al. also teach that the lens (10) is replaced, in the preferred embodiment, by a lens block comprising several lens elements coupled together.

16. As for claim 15, Chevrette et al. applies the concepts of figure 2 to the preferred embodiment (figure 3a) of the invention and disclose the image acquisition system of claim 9, further including a translation mechanism (24 and 26) coupled to the lens (11 in the embodiment) and operable to position the camera system to record the plurality of views of the area.

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17. As for claim 16, Chevrette et al. disclose, the image acquisition system of claim 15, wherein the camera system successively records the plurality of camera images. Chevrette et al. disclose, as shown in figure 1d, four images are recorded from four different displacements/views of the lens (1, 2, 3, and 4), thereby encompassing the entire field. The final image is then obtained from the four images previously acquired by interlacing all the pixels from the four views to form a high-resolution image.

18. As for claim 17, Chevrette et al. disclose, the image acquisition system of claim 9, wherein the camera lens (10) is positioned in a plane (L) substantially parallel to an image sensor (detector array with image plane 12).

19. For claim 21, Chevrette et al. disclose, as shown in figures 1d and 2, a method of scanning with a camera system, comprising the steps of:

- (a) recording a first view (1) of an area having one or more objects (helicopter) while a lens (10) is positioned at a first position (I) within a plane (L) substantially orthogonal to an optical axis (I) of the lens (10);

- (b) recording a second view (2) of the area while the lens (10) is positioned at a second position (I') within the plane (L); and

- (c) combining all recorded views to produce a composite image having a higher resolution than the resolution of one or more of the recorded views.

Chevrette et al. teach an imaging system comprising an array of sensing elements defining an image plane; a lens system adapted to focus an image on the image plane; and linear actuators coupled to the lens system for moving the lens system a predetermined amount and on a predetermined plane parallel to the image plane so that the image focused by the lens system

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on the array of sensing elements is displaced on the image plane by the movement of the lens system. Four images are recorded from four different displacements/views of the lens, thereby encompassing the entire field. The final image is then obtained from the four images previously acquired by interlacing all the pixels from the four views to form a high-resolution image.

20. As for claim 22, Chevrette et al. disclose, the method of claim 21, further comprising between step (b) and step (c), the step of:

(d) recording a next view (third view) of the area while the lens is positioned at a next position. Chevrette et al. teach the recording of four views; each view coming from a lens in a distinct offset position to record a first view, a second view, a third view, and a fourth view.

21. As for claim 23, Chevrette et al. disclose, the method of claim 22, further comprising the step of:

(e) repeating step (d) until all views of the area have been recorded. Chevrette et al. teach the recording of four views; each view coming from a lens in a distinct offset position to record a first view, a second view, a third view, and a fourth view. The final image is then obtained from the four images previously acquired by interlacing all the pixels from the four views to form a high-resolution image.

22. As for claim 24, Chevrette et al. disclose, the method of claim 21, wherein step (c) included the step of mosaicing all recorded views of the area. Chevrette et al. teach the recording of four views; each view coming from a lens in a distinct offset position to record a first view, a second view, a third view, and a fourth view. The final image is then obtained from the four images previously acquired by interlacing all the pixels from the four views to form a high-resolution image (see figure 1d).

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23. Claims 18 – 20, 29, and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Meyers.

24. For claim 18, Meyers discloses, as shown in figures 1A, 1B, 2, and 9 and as stated in columns 3 (lines 46 – 55), 4 (lines 26 – 62), 5 (lines 31 – 67), 6 (lines 1 – 27), and 13 (lines 5 – 61), an image acquisition system, comprising: a plurality of cameras (each sub-group of photodetectors 22) operable to record an area having multiple views, the area includes one or more objects, wherein each camera is operable to record at least one of the views to produce one or more camera images, wherein at least one of the cameras has an offset lens (see figure 2; lenslet 12) to produce an oblique field of view; and an image processing system (located on chip0 coupled to the plurality of cameras and operable to combine the plurality of camera images to produce a composite image. Meyers teach of a multiple camera system, in which each camera is defined as a sub-group of photodetectors of the entire array of photodetectors. Each sub-group of photodetectors, as stated in column 5 (lines 31 – 42), is provided with associated electronics containing multiplexing, clocking circuits, current mirrors, correlated double sampling, an analog-to-digital converter, and a non-volatile memory cell. As shown in figures 1A and 2, each camera has its own lens (lenslet 12) wherein at least one of the cameras has an offset lens (14). The sub-images from each camera (sub-group of photodetectors) are stitched with the other sub-images to form a composite image with high-resolution.

25. As for claim 19, Meyers discloses, the image acquisition system of claim 18, wherein all camera images are recorded simultaneously.

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26. As for claim 20, Meyers discloses, as stated in column 13 (lines 24 – 34), the image acquisition system of claim 18, wherein the image processing system is operable to produce the composite image by mosaicing the camera images.

27. For claim 29, Meyers discloses, as shown in figures 1A, 1B, 2, and 9 and as stated in columns 3 (lines 46 – 55), 4 (lines 26 – 62), 5 (lines 31 – 67), 6 (lines 1 – 27), and 13 (lines 5 – 61), a method of scanning with a camera system having a plurality of cameras, comprising the steps of:

(a) recording a plurality of views of an area having one or more objects with a plurality of cameras (each sub-group of photodetectors 22), each camera having a lens (lenslet 12 of lenslet array 10) positioned within a plane substantially orthogonal to an optical axis of the lens (see figure 2), and wherein one or more cameras has offset lens (14); and

(b) combining all recorded views to produce a composite image having a higher resolution than the resolution of one or more of the recorded views (see column 6, lines 19 – 23).

Meyers teach of a multiple camera system, in which each camera is defined as a sub-group of photodetectors of the entire array of photodetectors. Each sub-group of photodetectors, as stated in column 5 (lines 31 – 42), is provided with associated electronics containing multiplexing, clocking circuits, current mirrors, correlated double sampling, an analog-to-digital converter, and a non-volatile memory cell. As shown in figures 1A and 2, each camera has its own lens (lenslet 12) wherein at least one of the cameras has an offset lens (14). The sub-images from each camera (sub-group of photodetectors) are stitched with the other sub-images to form a composite image with high-resolution.

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28. As for claim 30, Meyers discloses, as stated in column 13 (lines 24 – 34), the method of claim 29, wherein step (c) includes the step of mosaicing all recorded views of the area.

Claim Rejections - 35 USC § 103

29. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

30. Claims 3, 5, 10 – 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chevrette et al. For the following rejections please refer to figures 1d, 2, 3a, 3b, 4a, 4b, and 5 and columns 6 (lines 34 – 67), 7, and 8 (lines 1 – 39). The Examiner notes that figures 1d and 2 encompass the scope of the invention while figures 3a, 3b, 4a, 4b, and 5 show varying embodiments of the invention.

31. For claim 3, Chevrette et al. teach of a camera system that displaces a lens (10) by a distance (d), thereby displaying the optical axis of the lens, as well as the focal point, and the image on the image plane of the detector array by the same distance while capturing an image at each offset position. Chevrette et al. teach wherein the image sensor represents a CCD array sensor (detector array). Chevrette et al. do not disclose wherein the image sensor represents a CCD linear sensor. Although, Chevrette et al. do not disclose a CCD linear sensor, at the time the invention was made, one with ordinary skill in the art would have been motivated to use a CCD linear sensor rather than a CCD array sensor, since the final image is composed after the lens has been offset in a certain number of predetermined positions to encompass the entire field of view

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in which the user is trying to capture. Therefore, incorporating a CCD linear sensor rather than a CCD array sensor would be easily accomplished by varying the plurality of predetermined offset positions of the lens. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to have included a CCD linear sensor rather than the CCD array sensor.

32. As for claim 5, it is inherent that a light shield exists and that a housing partially encloses the image sensor. Since it is inherent that a light shield and housing exists, Chevrette et al. do not disclose wherein the light is a bellows. Official Notice is taken that both the concepts and the advantages of using a bellows as a light shield are well known and expected in the art. It would have been obvious to use a bellows light shield as means to provide a light shield which is flexible and pliable so as to move in conjunction with the lens and its offset positions rather than a rigid light shield preventing lens offsetting.

33. As for claim 10, Chevrette et al. teach the recording of four views; each view coming from a lens in a distinct offset position to record a first view, a second view, a third view, and a fourth view. The final image is then obtained from the four images previously acquired by interlacing all the pixels from the four views to form a high-resolution composite image.

Chevrette et al. teach the image acquisition system is well suited to being used in a microprocessor driven system (see column 8, lines 32 – 36), therefore, it is inherent that all devices/processes, including an image processing system, within the system are computer-controlled. Chevrette et al. do not explicitly disclose a display device coupled to the image processing system operable to display the composite image. Official Notice is taken that both the concepts and the advantages of coupling a display device to the image processing system

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operable to display the composite image are both well known and expected in the art. It would have been obvious to include a display system coupled to the image processing system for display of the composite image as a means to display the composite image for user preview/approval before recording subsequent images.

34. As for claim 11, Chevrette et al. disclose, the image acquisition system of claim 10, wherein the camera lens (10) is positionable within a plane (L – with the solid black lines and the dotted black lines representative of light rays when the lens is positioned in a plurality of predetermined offset positions I and I') to a plurality of offset positions, and wherein an image sensor (detector array) is operable to detect light rays originating from one of the plurality of views when the camera lens is positioned at a corresponding one of the plurality of offset positions (see figure 1d).

Chevrette et al. teach of a camera system that displaces the lens (10) by a distance (d), thereby displaying the optical axis of the lens, as well as the focal point, and the image on the image plane by the same distance while capturing an image at each offset position. Chevrette et al. also teach that the lens (10) is replaced, in the preferred embodiment, by a lens block comprising several lens elements coupled together.

35. As for claim 12, although Chevrette et al. do not explicitly teach, the image acquisition system of claim 11, wherein the image sensor further includes a light shield and a housing partially enclosing the image sensor, the light shield attached between the lens and the housing, it is inherent that a light shield exists and that a housing partially encloses the image sensor. If a housing, which partially encloses the image sensor, and light shield which is attached between the lens and the housing, did not exist, the camera system of Chevrette et al. would be an

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inoperable system, by continuously saturating the image sensor and producing images not representative of the scene in which the user is attempting to capture.

36. As for claim 13, Chevrette et al. teach, the image acquisition system of claim 12, wherein the camera system includes one or more video cameras (detector array). Chevrette et al. teach of a detector array capturing a series of still images, hence video, therefore, Chevrette et al. teach of one video camera.

37. As for claim 14, Chevrette et al. teach of a camera system that displaces a lens (10) by a distance (d), thereby displaying the optical axis of the lens, as well as the focal point, and the image on the image plane of the detector array by the same distance while capturing an image at each offset position. Chevrette et al. teach wherein the camera system includes one or more video cameras (detector array). Chevrette et al. do not disclose wherein the camera system includes one or more line-scan cameras. Although, Chevrette et al. do not disclose a line-scan camera, at the time the invention was made, one with ordinary skill in the art would have been motivated to use a line-scan camera rather than a array video camera, since the final image is composed after the lens has been offset in a certain number of predetermined positions to encompass the entire field of view in which the user is trying to capture. Therefore, incorporating a line-scan camera rather than an array video camera would be easily accomplished by varying the plurality of predetermined offset positions of the lens. Therefore, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to have included a line-scan camera rather than the array video camera.

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Allowable Subject Matter

38. Claims 25 – 28 are allowed.

39. For claims 25- 28, the prior art does not teach or fairly suggest a method of scanning with a camera, with a lens in an offset position within a plane substantially orthogonal to an optical axis, recording a first view in a first position, rotating the camera to a second position to record a second view while the lens is in the said offset position.

Conclusion

40. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

41. Fritzel (US 5 339 188) teaches an image acquisition system and an associated method, using a mirror in a plurality of offset positions, within a plane substantially orthogonal to an optical axis, reflecting sub-images to a photodetector array centered along the axis of rotation of the mirror.

42. Fuerhoff (US 5 656 078) teaches of an image acquisition system, using a camera with an offset lens, within a plane substantially orthogonal to an optical axis, recording a single view.

43. Sussman et al. (US 5 686 960) teach of an image acquisition system, using an image sensor and a rotating optical disk, positioned so as to direct incoming light from an area, divided into a plurality of blocks, into the image sensor. The sub-imaged plurality of blocks from the entire area forms a composite image of the entire area.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin P Misleh whose telephone number is 703.305.8090. The examiner can normally be reached on Monday - Friday, 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy R Garber can be reached on 703.305.4929. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9314 for regular communications and 703.872.9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is 703.306.0377.

JPM
June 27, 2003


WENDY R. GARBER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600